



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,018	07/15/2003	Daniel C. Merkel	H0004175	8618

7590 03/21/2007  
Colleen D. Szuch, Esquire  
Honeywell International, Inc.  
101 Columbia Road  
P.O. Box 2245  
Morristown, NJ 07962-2245

EXAMINER
----------

NGUYEN, NGOC YEN M

ART UNIT	PAPER NUMBER
----------	--------------

1754

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

5

<b>Office Action Summary</b>	<b>Application No.</b> 10/620,018	<b>Applicant(s)</b> MERKEL ET AL.	
	<b>Examiner</b> Ngoc-Yen M. Nguyen	<b>Art Unit</b> 1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 January 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4-8,10-12 and 16-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21 is/are allowed.
- 6) ☒ Claim(s) 1,4-8,10-12,16-20 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

Claim 21 is allowed.

The following is a statement of reasons for the indication of allowable subject matter: the prior art does not teach or suggest a method for producing anhydrous fluoride by first extracting hydrogen fluoride using a concentrated sulfuric acid and then flash distilling the obtained sulfuric acid/HF mixture to provide a first HF product, adding water to the first HF product to form a dilute HF mixture and distilling the dilute HF mixture to obtain anhydrous hydrogen fluoride.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-8, 10-12, 16-20, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB '1,052,118, optionally further in view of Swain (5,895,639) and Belter (5,874,658).

GB '118 discloses a process for separating hydrogen fluoride in the production of fluorine-containing halogenated hydrocarbon, the method comprising contacting the gaseous mixture with aqueous sulfuric acid of at least 70% concentration to selectively

Art Unit: 1754

absorb the hydrogen fluoride (note claim 1). The lower limit of 70% is well within the claimed range.

GB '118 also discloses that the boiling point of the fluorinated product is close to that of hydrogen fluoride (note page 1, lines 36-41). This fairly teaches that the hydrogen fluoride and the fluorine-containing halogenated hydrocarbon is an azeotrope or azeotropic-like mixture.

In the example, a gaseous mixture generated in the production of monochlorodifluoromethane from chloroform and hydrogen fluoride was the starting mixture (note page 2, lines 61-63).

For claims 16-20, since the process of GB '118 has all the positive process limitation as required in the instant claims, the hydrogen fluoride product of the GB '118 would inherently have the same low amount of sulfur and TOC impurities as the product of the claimed process.

For other value other than "70%" for the sulfuric acid concentration, the range of "at least 70%" as disclosed in GB '118 overlaps the claimed ranges. With respect to the encompassing and overlapping ranges previously discussed, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time of invention to select the portion of the prior art's range which is within the range of the applicants' claims because it has been held prima facie case of obviousness to select a value in a known range by optimization for the results. *In re Boesch*, 205 USPQ 215. Additionally, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time invention was made to have selected the overlapping portion of the range

Art Unit: 1754

disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness. *In re Malagari*, 182 USPQ 549.

Beside the monochlorodifluoromethane as disclosed in the example, GB '118 discloses generically that process can be used to separate HF from "halogenated hydrocarbon" (note claim 1). Thus, it would have been obvious to one of ordinary skill in the art to use the process of GB '118 to separate other halogenated hydrocarbon, other than monochlorodifluoromethane from HF.

GB '118 further teaches that the HF, which is absorbed in the sulfuric acid, is separated and recycled (note page 2, lines 77-81). Without a showing of criticality or unexpected results, it would have been obvious to one skilled in the art to use any known method in the art, such as flash distillation or fractional distillation, to separate the HF from the sulfuric acid in order to recycle both.

Optionally, Swain '639 can be applied as stated below.

Swain '639 discloses a process for separation of hydrogen fluoride from fluorocarbon/HF mixture by sulfuric acid (note claim 1). Swain '639 also teaches that the mixture can be an azeotrope (note column 2, lines 37-38). Swain further discloses that HF is separated from the sulfuric acid by distillation (note column 4, lines 13-14). The separated HF and sulfuric acid can be recycled (note column 3, lines 23-27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to separate the HF from the sulfuric acid in the process of GB '118, as suggested by Swain '639 because by doing so the HF and sulfuric acid can be recycled.

Art Unit: 1754

Belter '658 can be applied to teach that it is conventional in the art to form chlorofluorocarbons, hydrofluorocarbons and hydrochlorofluorocarbons by reacting hydrogen fluoride with a suitable chlorocarbon or hydrochlorocarbon (note column 1, lines 13-17). The HF used and recovered in Belter '658 is anhydrous HF (note column 3, lines 1-3).

Since the HF acid used in Belter '658 is anhydrous hydrogen fluoride (note column 3, lines 2-3), It would also have been obvious to one skilled in the art to optimize the distillation process in GB '118 to obtain anhydrous HF. The Examiner takes Official notice that flash distilling and the step of distilling a diluted HF to obtain anhydrous hydrogen fluoride are known and conventional steps in the art. Using a combination of different distillation methods to achieve the cumulative effect would also have been well within the skill of the artisan.

Applicant's arguments and declaration filed January 3, 2007 have been fully considered but they are not persuasive.

Applicants argue that Applicants have unexpectedly found that flashing an HF and sulfuric acid stream and then fractionating the resulting HF distillate dramatically decreases the level of sulfur impurities in the HF product.

Applicants' argument and declaration have been fully considered but they are not persuasive because there is no evidence on record to support the alleged unexpected results. It is noted that Applicants' claims not only require the combination of flash distillation and fractionation distillation, but also the use of lower concentration of sulfuric

Art Unit: 1754

acid in order to produce anhydrous hydrogen fluoride with low sulfur impurities. In Applicants' comparative examples, the high level of sulfur impurities is due to the use of the high concentration sulfuric acid. Applicants have not provided any comparative example to show that using low concentration sulfuric acid but without the flash distillation would result in high level of sulfur impurities in the anhydrous HF product.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. "Distillation", pages 1-9 from Wikipedia, the free encyclopedia, is cited to show that flash and fractional distillations are known and conventional in the art.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

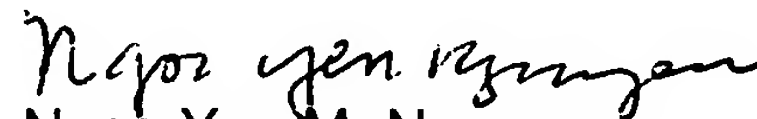


Art Unit: 1754

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner is currently on a Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Ngoc-Yen M. Nguyen  
Primary Examiner  
Art Unit 1754

nmn  
March 19, 2007